

TITLE OF THE INVENTION

DISTRIBUTION METHOD OF MEDICAL INFORMATION

CROSS-REFERENCE TO RELATED APPLICATIONS

This is a Continuation Application of PCT  
5 Application No. PCT/JP02/10173, filed September 30,  
2002, which was not published under PCT Article 21(2)  
in English.

This application is based upon and claims the  
benefit of priority from prior Japanese Patent  
10 Application No. 2001-304121, filed September 28, 2001,  
the entire contents of which are incorporated herein by  
reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

15 The present invention relates to a distribution  
method of medical information.

2. Description of the Related Art

In recent years, in genome drug production by use  
of a gene information technique which has flourished,  
20 it has been very important to acquire clinical data,  
especially a relation between a disease and a gene  
arrangement, or a relation between a function of a drug  
and the gene arrangement for development. When the  
patient's gene data is quickly obtained in a large  
25 amount, the development of a competitive drug is  
largely influenced.

Moreover, it has been recognized that the

relations between the genes and the diseases or the  
drugs have been gradually clarified even in hospitals  
or inspection centers and that when the relations are  
quickly taken into medical treatments, reductions of  
5 medical costs or labor costs result.

However, there is not any valuable distribution  
route in a method of acquiring the patient's gene data,  
and each pharmaceutical institution individually  
cooperates with the hospital or the inspection center  
10 to acquire the data. There is a problem that it is  
difficult to acquire high-quality data in large amounts  
by individual handling.

Moreover, in the present situation, gene  
inspection requires large amounts of inspection and  
15 labor costs, further there is not any method of  
checking a relation with medical information required  
for making use of the data, and therefore the  
inspection has not spread. Since the inspection and  
labor costs increase, the gene information is supplied  
20 to the pharmaceutical institution in a small amount,  
and this has formed a vicious circle to inhibits the  
spreading.

#### BRIEF SUMMARY OF THE INVENTION

An object of the present invention is to provide  
25 a distribution method of medical information, which is  
capable of lowering prices of inspection apparatuses  
and consumables such as reagent associated consumables

to largely lower a cost of inspection.

Moreover, another object of the present invention is to provide a distribution method of medical information, in which a research institution can easily acquire a large amount of patient data constantly updated to up-to-the-minute information and in which a medical care/test institution can take in latest medicine or disease data from the research institution to obtain latest analysis results.

According to a first aspect of the present invention, there is provided a distribution method of medical information, in which a single or a plurality of medical care/test institutions, an information management institution, and a single or a plurality of research institutions distribute the medical information with one another, the distribution method of the medical information, comprising:

a step of transmitting the medical information obtained by use of apparatuses and/or consumables such as reagent associated consumables to obtain the medical information from a patient or a specimen to the information management institution from the medical care/test institution;

a step of searching a database by the use of the medical information received from the medical care/test institution to return a search result to the medical care/test institution, and changing the medical

information received from the medical care/test institution into a predetermined format to store clinical data in the database in the information management institution;

5           a step of transmitting an inquiry for the clinical data to the information management institution from the research institution; and

          a step of searching the database based on the inquiry received from the research institution to  
10       return the search result to the research institution from the information management institution,

          wherein the apparatuses and/or the consumables such as the reagent associated consumables to obtain the medical information are supplied to the medical  
15       care/test institution from the information management institution at a charge or free of charge.

          Moreover, according to a second aspect of the present invention, there is provided a distribution method of medical information, in which a single or a  
20       plurality of medical care/test institutions, an information management institution, a single or a plurality of research institutions, and a single or a plurality of manufacturing/selling institutions of apparatuses and/or consumables such as a reagent  
25       associated consumable distribute the medical information with one another, the distribution method of the medical information, comprising:

a step of transmitting the medical information obtained by use of apparatuses and/or consumables such as reagent associated consumables to obtain the medical information from a patient or a specimen to the information management institution from the medical care/test institution;

a step of searching a database by the use of the medical information received from the medical care/test institution to return a search result to the medical care/test institution, and changing the medical information received from the medical care/test institution into a predetermined format to store clinical data in the database in the information management institution;

a step of transmitting an inquiry for the clinical data to the information management institution from the research institution; and

a step of searching the database based on the inquiry received from the research institution to return the search result to the research institution from the information management institution,

wherein the apparatuses and/or the consumables such as the reagent associated consumables to obtain the medical information are supplied to the medical care/test institution from the information management institution at a charge or free of charge, and a rebate is supplied to the manufacturing/selling institutions

of the apparatuses and/or the consumables such as the reagent associated consumables from the information management institution.

Furthermore, according to a third aspect of the present invention, there is provided a distribution method of medical information, in which a single or a plurality of medical care/test institutions, an information management institution, and a single or a plurality of research institutions distribute the medical information with one another, the distribution method of the medical information, comprising:

a step of sending a specimen to the information management institution from the medical care/test institution;

a step of obtaining the medical information with respect to the sent specimen in the information management institution;

a step of searching a database by use of the medical information to return a search result to the medical care/test institution, and changing the obtained medical information into a predetermined format to store clinical data in the database;

a step of transmitting an inquiry for the clinical data to the information management institution from the research institution; and

a step of searching the database based on the inquiry received from the research institution to

return the search result to the research institution from the information management institution.-

5           Additionally, according to a fourth aspect of the present invention, the distribution method of the medical information relates to the distribution method of the medical information according to the first aspect of the present invention, and further comprises: a step of transmitting specific medicine data to the information management institution from the research  
10           institution; and

          a step of updating the database by the received medicine data in the information management institution.

15           Moreover, according to a fifth aspect of the present invention, the distribution method of the medical information relates to the distribution method of the medical information according to the second aspect of the present invention, and further comprises: a step of transmitting specific medicine data to the  
20           information management institution from the research institution; and

          a step of updating the database by the received medicine data in the information management institution.

25           Furthermore, according to a sixth aspect of the present invention, the distribution method of the medical information relates to the distribution method

of the medical information according to the third  
aspect of the present invention, and further comprises:  
a step of transmitting specific medicine data to the  
information management institution from the research  
5 institution; and

a step of updating the database by the received  
medicine data in the information management  
institution.

Moreover, the distribution method of the medical  
10 information according to a seventh aspect of the  
present invention relates to the distribution method of  
the medical information according to the first aspect  
of the present invention, and a fixed global IP address  
is attached to the apparatus to obtain the medical  
15 information.

Furthermore, the distribution method of the  
medical information according to an eighth aspect of  
the present invention relates to the distribution  
method of the medical information according to the  
20 second aspect of the present invention, and a fixed  
global IP address is attached to the apparatus to  
obtain the medical information.

Additionally, the distribution method of the  
medical information according to a ninth aspect of the  
25 present invention relates to the distribution method of  
the medical information according to the third aspect  
of the present invention, and a fixed global IP address

is attached to the apparatus to obtain the medical information.

Moreover, the distribution method of the medical information according to a tenth aspect of the present invention relates to the distribution method of the medical information according to the first aspect of the present invention, and further comprises a step of subjecting the medical information to an interpolation preventive measure and encryption.

Furthermore, the distribution method of the medical information according to an eleventh aspect of the present invention relates to the distribution method of the medical information according to the second aspect of the present invention, and further comprises a step of subjecting the medical information to an interpolation preventive measure and encryption.

Additionally, the distribution method of the medical information according to a twelfth aspect of the present invention relates to the distribution method of the medical information according to the third aspect of the present invention, and further comprises a step of subjecting the medical information to an interpolation preventive measure and encryption.

It is to be noted that the "apparatus" mentioned in the present embodiment refers to means for use to obtain various biological inspection data which is medical information required for researching a

medicine, new biological material and the like which  
can be objects of the research, and refers to the  
apparatus at least a part of which is mechanized and  
preferably automated. The "reagent associated  
5 consumables" mentioned in the present embodiment  
broadly refer to reagents which are consumables for  
use in the biological inspection, and can be optional  
reagents in response to a required biological reaction.  
The consumables sometimes refer to containers for  
10 reaction which are integrally used together with the  
reagents and discarded or collected as the consumables  
after one or more uses. These "apparatus" and  
"reagent" are sold or lent alone or both and are  
objects of purchase and sale, and therefore the  
15 "apparatus" and/or the "reagent" is distributed even  
in the present invention. It is to be noted that the  
biological inspection in the present invention can  
be an optional inspection in accordance with purposes  
such as diagnosis of the medical information and  
20 medical effects (e.g., healing capacity, preventive  
capacity value, etc.), and can be, for example,  
an optional combination of a genetic (allergy,  
infection, transplantation immunity, etc.) inspection,  
a biochemical (enzyme, hormone, etc.) inspection and  
25 the like.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

FIG. 1 is a diagram schematically showing a flow

of information among three of an medical care/test institution and an information management institution and a drug creation research institution in a first embodiment of the present invention;

5           FIG. 2 is a diagram showing a flow at a time when information, apparatus and/or reagent, and consideration are mutually exchanged among a plurality of medical care/test institutions, a plurality of drug creation research institutions, and the information  
10           management institution;

          FIG. 3 is a diagram showing a constitution in which an apparatus and/or reagent manufacturing/selling institution is disposed in addition to the three including medical care/test institution, information  
15           management institution, and drug creation research institution; and

          FIG. 4 is a diagram schematically showing a flow of information in a case which a specimen sent from the medical care/test institution is measured in the  
20           information management institution in a second embodiment of the present invention.

#### DETAILED DESCRIPTION OF THE INVENTION

          An embodiment of the present invention will be described hereinafter in detail with reference to  
25           the drawings. In a distribution method of medical information according to the present invention, it is first assumed that information, apparatus and/or

reagent, and consideration are exchanged among three  
including a medical care/test institution, information  
management institution, and drug creation research  
institution. Here, the medical care/test institution  
5 means, for example, a hospital, inspection center and  
the like, the information management institution means  
an information search company, information analysis  
service company and the like, and the drug creation  
research institution means, for example, a  
10 pharmaceutical maker, public research institute and the  
like.

FIG. 1 is a diagram schematically showing a flow  
of information among three including the medical  
care/test institution, information management  
15 institution, and drug creation research institution.  
In the present embodiment, all flows of some pieces of  
classified information are made with respect to one  
database or a plurality of databases which mutually  
closely cooperate.

20 In FIG. 1, [1] Flow of inspection data will be  
described hereinafter. First, a medical care/test  
institution 100 performs inspection, for example, by  
use of the apparatus and/or the reagent supplied from  
an information management institution 200 (S1), and  
25 transmits medical data (medical information) obtained  
by the inspection to the information management  
institution 200 (S2). The information management

institution 200 receives the data (S3), performs a database search, extraction process (S4), and acquires a certain result (S5). This result is returned as auxiliary information effective for diagnosis to the medical care/test institution 100 (S6). The medical care/test institution 100 performs the diagnosis by the use of the received result (S7).

Moreover, the information management institution 200 individually sorts out the data received from the medical care/test institution 100, changes the data into a predetermined format, and stores the data (S8). This can be used in protecting privacy of inspection data.

Next, [2] Flow of clinical data will be described. First, when an inquiry concerning the clinical data is generated (S9), a drug creation research institution 300 transmits the inquiry to the information management institution 200 (S10). The information management institution 200 receives the inquiry (S11), searches and extracts the database (S12), and acquires some result (S13). The information management institution 200 returns the acquired result to the drug creation research institution 300 (S14). The drug creation research institution 300 performs research/development by the use of the received result (S15). It is to be noted that the privacy of the returned result needs to be sufficiently protected.

Next, [3] Update of medicine data will be described. First, on acquiring new medicine data (S16), the drug creation research institution 300 transmits the data to the drug creation research institution 300 (S17). The information management institution 200 receives the new medicine data (S18), and updates the database (S19). At this time, the reception of the medicine data includes charged and published reception, and includes reception free of charge, or reception by contract with an institution which receives the clinical data by the flow of [2]. The information management institution may also act so as to acquire the medicine data by itself.

It is to be noted that an order in which the above-described [1], [2], [3] can occur is not limited to the above-described order and that, for example, [3] Update of medicine data, [2] Flow of clinical data, and [1] Flow of inspection data may also occur in order.

A relation among the medical care/test institution, information management institution, and drug creation research institution, and a function of the information management institution, required for realizing the distribution method of the medical information according to the present embodiment will be described hereinafter.

FIG. 2 shows a flow at a time when a plurality of medical care/test institutions 100-1, 2, 3, ...

(hereinafter described only with respect to 100-1 which is an example), a plurality of drug creation research institutions 300-1, 2, 3, ... (hereinafter described only with respect to 300-1 which is an example), and the information management institution 200 mutually exchange information, apparatus, and consideration. Moreover, as shown in FIG. 2, the information management institution 200 includes various information databases 201 including a medicine information database or a disease information database, a clinical information database 202, a data sort-out device 203, an analysis/calculation device 204, a search/extraction calculation device 205, and an information communication function 206.

When the information management institution 200 includes the above-described elements, the following functions can be realized.

(a) The information management institution 200 supplies the apparatus and/or reagent to obtain the medical information, and attached consumables, for example, with respect to the medical care/test institution 100-1 ((A) of FIG. 1). This is performed regardless of charges. In a charged case, the information management institution 200 receives an apparatus consideration (X).

(b) The information management institution 200 receives measurement data ((B) of FIG. 1) obtained by

performing the inspection by the use of the apparatus  
and/or the reagent by the medical care/test institution  
100-1 from the medical care/test institution 100-1 via  
networks such as the Internet. The  
5 analysis/calculation device 204 analyzes the data by  
the use of the various information databases 201 in  
accordance with purposes, and analysis results ((C) of  
FIG. 1) are returned to the medical care/test  
institution 100-1. The consideration is not required  
10 concerning the information supply or has a low amount  
inversely proportional to an information amount and/or  
quality.

(c) The information management institution 200  
sorts out the data received via the network in (b) by  
15 the use of attached information (e.g., race, gender,  
age, clinical history, etc.) by the data sort-out  
device 203 to add or update the data with respect to  
the clinical information database 202.

(d) The information management institution 200  
20 searches the clinical information database 202 in  
a range permitted by contract and the like by the  
search/extraction calculation device 205 with respect  
to the inquiry for the clinical data ((D) of FIG. 1),  
for example, from the drug creation research  
25 institution 300-1, and returns a search result (E)  
to the drug creation research institution 300-1.  
An access to the database is permitted in a range

determined by the contract. An information  
-----  
consideration (Y) is received with respect to the  
supply of the information.

5 (e) Furthermore, the information management  
institution 200 adds medicine information, disease  
information (F) and the like sent from the drug  
creation research institution 300-1 contracted in  
(d) and other pharmaceutical institutions to the  
corresponding database by the data sort-out device 203,  
10 so that latest information can be constantly supplied.  
These information are supplied regardless of charges,  
and the information management institution 200 is  
sometimes a main body to acquire the information.

Next, among the above-described functions (a)  
15 to (e), for (a), in addition to three institutions  
including the medical care/test institution,  
information management institution, and drug creation  
research institution, the apparatus and/or reagent  
manufacturing/selling institution is supposed to be  
20 disposed. This embodiment will be described  
hereinafter with reference to FIG. 3. As shown in  
FIG. 3, a plurality of apparatus and/or reagent  
manufacturing/selling institutions 400-1, 2, 3, ...  
(hereinafter described only with respect to 400-1 which  
25 is the example) are added to the constitution of  
FIG. 2.

The apparatus and/or reagent manufacturing/selling

institution 400-1 supplies the apparatus and/or the reagent from which the medical information is obtained and the attached consumables to the medical care/test institution 100-1 ((H) of FIG. 2). This is performed regardless of the charges. In the charged case, the apparatus and/or reagent manufacturing/ selling institution 400-1 receives an apparatus and/or reagent consideration (G) from the medical care/test institution 100-1.

The medical care/test institution 100-1 performs measurement by the use of the apparatus supplied from the apparatus and/or reagent manufacturing/selling institution 400-1, and sends the obtained measurement data (B) to the information management institution 200. On the other hand, the information management institution 200 supplies a rebate (Z) to the apparatus and/or reagent manufacturing/selling institution 400-1 by the contract.

As described above, when the medical care/test institution 100, information management institution 200, drug creation research institution 300, and apparatus and/or reagent manufacturing/selling institution 400-1 if necessary exchange the information, apparatus and/or reagent, and consideration, the following advantages are obtained.

1. Costs can largely be lowered with respect to the apparatus and/or the reagent and the consumables

and the analysis in the medical care/test institution.

-2. A large amount of clinical data can easily be obtained in the drug creation research institution.

It is to be noted that there is not any  
5 restriction as to the apparatus and/or the reagent for  
use in the medical care/test institution to obtain the  
medical information, but physical changes in light  
absorption, fluorescence, electric conductivity,  
temperature, viscosity and the like or the specimen  
10 or a carrier which has reacted to the specimen are  
measured by the apparatus and/or the reagent. More  
concretely, this includes an apparatus which measures  
an immune reaction of the specimen, an apparatus which  
measures genome/gene information of the specimen and/or  
15 reagent associated consumables for the measurement.  
These apparatuses are connected to a device connected  
to the network integrally or by cable or radio.  
Alternatively, the device is separately prepared.  
Furthermore, a fixed IP address defined by the existing  
20 IPv4 or IPv6 supposed to be a mainstream from now on is  
attached. When IPv4 or IPv6 is handled, and all the  
apparatuses can individually be handled, reliability  
of transmitted data from the information management  
institution is enhanced. It is also necessary to  
25 incorporate encryption or interpolation preventive  
measure for preventing interpolation or wiretapping of  
the data. Here, a case in which the rebate is not

carried out with respect to the apparatus and/or the reagent is also considered. In this case, the medical care/test institution cannot lower the cost with respect to the analysis, but the drug creation research institution has the advantage. There is an advantage that a latest analysis result by a latest database can constantly be received at a low price.

Moreover, database processing devices installed in the information management institution (the above-described data sort-out device 203, analysis/calculation device 204, search/extraction calculation device 205) may be any types of devices as long as the data is processed. Preferable examples include a large-sized computer, work station, personal computer and the like. The database processing device may not be owned by the information management institution, and may also be rental or leased. Furthermore, an installation place is not limited to the inside of a building possessed by the information management institution. For safety of the database, at least a part of the information or a duplicate of an information storage member may also be stored separately from the database processing device.

A content of the database held/managed in the information management institution changes with the inspection which is an object.

(Second Embodiment)

A second embodiment of the present invention will be described hereinafter. FIG. 4 is a diagram schematically showing a flow of information in a case in which a specimen sent from the medical care/test institution is measured in the information management institution.

In FIG. 4, [4] Flow of inspection data will be described hereinafter. First, the medical care/test institution 100 samples a specimen (S30), and sends the sampled specimen to the information management institution 200 (S31). The specimen may be genome electron data sufficient for the inspection of the specimen. The information management institution 200 receives and inspects the specimen (S32), searches and extracts the database by the use of the result at this time (S33), and acquires a certain result (S34). This result is returned as auxiliary information effective for diagnosis to the medical care/test institution 100 via the network, telegraph, or document (S35). The medical care/test institution 100 makes use of the received result and performs the diagnosis (S36).

Moreover, the information management institution 200 individually sorts out the data acquired by the database search, changes the data into the predetermined format, and stores the data (S37). This can be useful for the privacy protection of the inspection

data.

Moreover, details of [5] Flow of clinical data (S38 to S44) and [6] Update of medicine data (S45 to S48) are as described with reference to FIG. 1.

5           It is to be noted that the order in which the above-described [4], [5], [6] can occur is not limited to the above-described order and that, for example, [6] Update of medicine data, [5] Flow of clinical data, and [4] Flow of inspection data may also occur in this  
10           order.

          It is to be noted that the present invention is not limited to the above-described various examples, and can be further variously modified based on an essential concept of the present invention.  
15           For example, for all the information for use in the distribution in the present invention, one type or a plurality of types of networks among the Internet, LAN, satellite circuit, telephone circuit and the like are used. Moreover, for the information to be  
20           distributed, with reference to optional information to be concealed, including private information related to the privacy of the patient or the specimen, and attribute information usable for special purposes, such as race, religion, and family history, the information  
25           for the distribution is appropriately removed, canceled, masked, encrypted, and dummied or otherwise. Accordingly, the information may also be processed

into specified information specified partially or to  
such an extent that required data is contained, and  
distributed. In the distribution method of the medical  
information, institutions in optional locations can  
5 participate regardless of domestic/international  
inspections in a case where international regulations  
such as appropriate import/export provisions are  
observed. Therefore, nationalities of the medical  
care/test institution, information management  
10 institution, and drug creation research institution can  
be an optional combination (e.g., a combination of the  
medical care/test institution of a developing country,  
the research institution of an advanced country, and  
the information management institution in Japan). The  
15 same type of institutions or related institutions can  
be a combination of institutions having a plurality of  
different nationalities (e.g., a combination of the  
respective medical care/test institutions of an origin  
country of an infection and infection import/export  
20 countries) as long as the institutions satisfy the  
same purpose. Based on the scope of the present  
invention, in addition to the above-described various  
types of institutions, third institutions such as a  
support institution, entrusted institution, and branch  
25 station may also be interposed. As the case may be, a  
supplier of the medical information may be the patient  
or a deputy such as patient's family. Moreover, based

on the scope of the present invention, the present  
invention can be regarded as software for controlling  
each means to execute miscellaneous functions on the  
network for use in the above-described distribution  
5 method of the medical information, program, or a medium  
(magnetic optical disk, computerized program) in which  
the software or the program is stored or coded).

According to the present invention, an information  
management institution, or an apparatus and/or reagent  
10 manufacturing/selling institution if necessary is  
capable of entirely obtaining a profit, and therefore  
the profit does not have to be gained by sales of  
an apparatus. Accordingly, prices of inspection  
apparatuses and consumables can be reduced, and a cost  
15 of inspection can largely be lowered.

Moreover, a research institution can easily  
acquire a large amount of patient data constantly  
updated to latest information. Moreover, when latest  
medicine or disease data is taken in from the research  
20 institution, a medical care/test institution can  
constantly obtain a latest analysis result to use the  
result in diagnosis or medical treatment.